

REMARKS

In the above-identified Office Action independent Claims 1 and 17, the sole independent claims, were rejected as being obvious in view of the cited Guidash and Mendis patents. In this regard, however, it is believed that the foregoing amendments to Claims 1 and 17 make it clear that those claims are patentable over the rejecting references for the reasons given below.

In particular, the present invention can be characterized by the requirement that the reset operation, comprising turning on the reset switch and the transfer switch together at least in a predetermined period, is carried out twice and that both the first resetting and the second resetting are carried out for each frame, or that the second resetting is carried out successively (or immediately) after the photoelectric charge is transferred to the input terminal for an amplifier to read the signal.

In the cited Guidash patent, on the other hand, there is disclosed a reset operation for sweeping out a signal charge stored in a photodiode by opening a transfer gate and a reset gate simultaneously. What the Guidash reference does not disclose or suggest, however, is repeating the above reset operation after reading out a photoelectric charge stored in the photodiode. See column 4, line 47 stating that the reset operation is done once per frame. Accordingly, the Guidash patent does not disclose Applicants' claimed requirements in Claims 1 and 17, respectively, that the reset operation resetting both the photodiode and the input terminal for an amplifier simultaneously is repeated twice for each frame, or that the second resetting is carried out successively after the signal is read out subsequent to the first resetting.

These differences relate to an advantage of the present invention, in that the time needed for the first resetting can be shortened. That is, the first resetting, assuming for example that it is applied to a digital camera, is carried out after the release button is

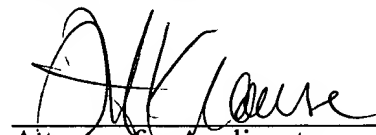
pushed and before the instant photographing operation starts. Therefore, if it takes a long time for the first resetting, the release time lag is a problem because the more electric charge that is left on the photodiode, the more time is needed for the first resetting. Furthermore, the first resetting may be carried out for all the pixels of the entire picture and if the saturated signals are stored throughout all the pixels, the first resetting could generate a large reset current and could cause a latch-up phenomenon.

Another advantage of Applicants' claimed invention is that the reset operation in its entirety can be performed efficiently. The efficiency of the reset operation depends not only on the length of time for resetting but also on the number of resettings (i.e. including rising and falling of a pulse). When the transfer switch is turned on, the potential is drastically lowered by the pulse rise and the resetting can be easily performed even when the potential is localized. Since the resetting is efficiently performed, subsequent photographings can be successfully carried out as in the initial photographing.

For all of these various reasons it is submitted that independent Claims 1 and 17, as well as all of the claims which depend from Claim 1, are allowable and the issuance of a formal Notice of Allowance is solicited.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,



Attorney for Applicants

John A. Krause

Registration No. 24,613

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200